Claims

1. A method for predicting and controlling the castability of liquid steel by analyzing the chemical composition of a melt to be cast, carrying out an alloy calculation and defining alloying elements and/or additives for obtaining specific material properties of the steel, and determining operating diagrams for further treatment of the melt, characterized in that the interactions of the alloying elements and/or additive elements influencing the castability are taken into account in the alloy calculation as supplementary conditions.

2. The method for predicting and controlling the castability of liquid steel as claimed in claim 1, characterized in that at least two alloying elements and/or additives at a time are related to each other to determine the effect of their proportions on the castability on the basis of data gathered from melts already cast.

3. The method for predicting and controlling the castability of liquid steel as claimed in claim 2, characterized in that the information "castable" or "uncastable" is assigned to each cast melt of the gathered data.

4. The method for predicting and controlling the castability of liquid steel as claimed in claim 2 or 3, characterized in that based on the data gathered on cast melts and based on the alloying elements and/or additives related to each other, at least one permitted range, within which a castable melt is expected, is defined for the proportions of alloying elements and/or additives.

5. The method for predicting and controlling the castability of liquid steel as claimed in claim 4, characterized

in that the permitted range is defined as an intersecting set of a plurality of inequalities.

6. The method for predicting and controlling the castability of liquid steel as claimed in claim 4 or 5, characterized in that the permitted range is defined as an intersecting set of a plurality of intersecting straight lines.

7. The method for predicting and controlling the castability of liquid steel as claimed in one of the preceding claims, characterized in that the interactions of the alloying elements and/or additive elements are implemented as mathematical models in a computer system.

8. The method for predicting and controlling the castability of liquid steel as claimed in claim 7, characterized in that fuzzy logic methods are used for the mathematical models.

9. The method for predicting and controlling the castability of liquid steel as claimed in claim 7 or 8, characterized in that neural networks are used for the mathematical models.

10. The method for predicting and controlling the castability of liquid steel as claimed in one of the preceding claims, characterized in that the alloy calculation is executed as an iterative technique.

11. The method for predicting and controlling the castability of liquid steel as claimed in one of the preceding claims, characterized in that a preselection of those alloying elements and/or additive elements that influence the castability of the melt is made for the alloy calculation.

12. The method for predicting and controlling the castability of liquid steel as claimed in one of the preceding claims, characterized in that interactions between the following alloying elements and/or additives are taken into account in the alloy calculation: C, Si, Mn, S, Al, N, Zn, O_2.

13. The method for predicting and controlling the castability of liquid steel as claimed in one of the preceding claims, characterized in that interactions of the following pairs of alloying elements and/or additives are taken into account in the alloy calculation: N/O_2, Zn/O_2, S/Zn, C/Zn, Mn/S, Mn/N, Si/C, Al/C, in particular Si/O_2, S/O_2, Al/O_2, S/C, N/C.

14. The method for predicting and controlling the castability of liquid steel as claimed in one of the claims 4 to 13, characterized in that the permitted range for one or each alloying element and/or one or each additive that results in a castable melt and the actual value measured in the melt are shown on the same graph.

15. The method for predicting and controlling the castability of liquid steel as claimed in claim 14, characterized in that the permitted range for one or each alloying element and/or one or each additive that results from the desired material properties and the actual value measured in the melt are shown on the same graph.

16. The method for predicting and controlling the castability of liquid steel as claimed in claim 14 or 15, characterized in that an updated actual value of an alloying element or an additive is shown after a treatment step carried out on the melt.

17. The method for predicting and controlling the castability of liquid steel as claimed in claim 16, characterized

in that after a plurality of treatment steps carried out on the melt, the respective actual values of an alloying element or an additive are shown as points connected together by straight-line segments.

18. The method for predicting and controlling the castability of liquid steel as claimed in one of the preceding claims, characterized in that it is used in a thin-strip continuous casting machine, in particular according to the principle of the twin-roller casting process.

19. A control device for a secondary metallurgical machine, in particular a ladle furnace, having a means for analyzing the chemical composition of a steel melt that is to be cast, a means for carrying out an alloy calculation to define alloying elements and/or additives in order to obtain specific material properties of the steel, and a means for determining operating diagrams for further treatment of the melt, characterized in that it is embodied to carry out the method as claimed in one of the claims 1 to 18.